

## **REMARKS**

Claims 13-32 are pending in the application. Claims 1-12 were canceled by way of the Preliminary Amendment dated January 24, 2002. Claim 13 is amended to indicate that at least 95 mole % of the NCO groups are reversibly blocked. Support for the Amendment can be found at page 4, lines 5-9 of the specification.

### **Rejections under 35 U.S.C. § 103(a)**

Claims 13-32 stand rejected under 35 U.S.C. § 103(a) as being obvious over U.S. Patent No. 6,060,574 to Schmalstieg et al. (hereinafter "Schmalstieg") in view of U.S. Patent No. 4,001,232 to Groegler et. al. (hereinafter "Groegler"). The Examiner alleges that it would have been obvious to employ the catalyst of 2,3-dimethyl-3,4,5,6-tetrahydropyrimidine as the catalyst of Schmalstieg, since Schmalstieg specifically refers to the compounds of Groegler as a suitable catalyst. Applicants respectfully disagree.

The present invention is directed to a solventless reactive system, which is curable at room temperature. The system includes

- A) a polyisocyanate that contains at least one organic polyisocyanate having a molecular weight of 168 to 25,000 where at least 95 mole % of the NCO groups are reversibly blocked with at least one hydrocarbon resin containing phenolic OH groups and having a hydroxyl group content of 0.1% to 10.0%,
- B) at least one organic amine having at least 2 primary amino groups,
- C) an oxirane compound containing more than one epoxy group per molecule and
- D) a catalyst comprising 2,3-dimethyl-3,4,5,6-tetrahydropyrimidine.

Schmalstieg discloses a reactive composition containing A) an organic polyisocyanate having a number average molecular weight of 168 to 25,000, where the isocyanate groups are reversibly blocked with a hydrocarbon resin containing phenolic OH groups, B) at least one organic polyamine having at least two primary amino groups and C) optionally a compound containing oxirane groups. The composition can include 2-methyltetra-hydropyrimidines which are substituted in the

1-position, which can be obtained as described in DE-A 2,439,550 (Groegler) by reacting N-monosubstituted 1,3-propane diamines with acetoacetic acid derivatives.

Groegler discloses a process for preparing 1-substituted, 2-methyltetrahydropyrimidine by reacting an N-substituted propylene diamine with an acetoacetic acid ester or amide. The 1-substituted group can be a straight-chain, branched-chain or cyclic, saturated, unsaturated or aromatic, optionally substituted hydrocarbon radical with from 1 to 17 carbon atoms.

Claims 13-32 stand rejected under 35 U.S.C. § 103(a) as being obvious over U.S. Patent Nos. 4,753,826 to Lauman (hereinafter "Lauman") and 6,153,709 to Xiao et al. (hereinafter "Xiao") in view of Schmalsteig, JP 50-117771, and U.S. Patent Nos. 4,908,408 to Boutillier et. al. (hereinafter "Boutillier") and 6,486,256 to Tarbutton et al. (hereinafter "Tarbutton"). The Examiner alleges that it would have been obvious to use the 2,3-dimethyl-3,4,5,6-tetrahydropyrimidine of JP 50-117771 and Tarbutton as the catalyst of Lauman and Xiao in order to optimize the reaction rate and/or temperature and to improve the load durability and impact resistance. Applicants respectfully disagree.

Lauman discloses an abrasion resistant polymer and coating composition comprising a liquid epoxy resin, a blocked isocyanate prepolymer, a rheological additive, a curing agent, a plasticizer, and a silane.

Xiao discloses a formulation for covering vehicle panels with a chip resistant, vibration damping coating. The formulation includes a blocked polyurethane prepolymer (or a blocked polyisocyanate and a polyol), an epoxy resin, a filler and a plasticizer.

Boutillier discloses a composition for a cross-linkable hot melt adhesive formed by an ethylene-vinyl acetate copolymer containing primary hydroxyl functions and a blocked polyisocyanate. This composition when associated with a tackifying resin, which can also serve as blocking agent of the polyisocyanate, is a cross-linkable hot melt adhesive. The adhesive is used at a temperature at least equal to the splitting temperature of the isocyanate functionality of the polyisocyanate.

Tarbutton discloses a two-part composition useful as an adhesive that includes an epoxy resin, a chain extender selected from an amine or a phenolic

compound, a base catalyst and a polymeric toughener wherein Part A contains the catalyst and Part B contains the epoxy resin.

JP 50-117771 discloses the preparation of oxazolidone or polyoxazolidones from epoxy compounds and organic isocyanates using cycloamides as catalysts.

In the present invention, Applicants sought to provide reactive systems curable at room temperature, based on blocked polyisocyanates, polyamines and compounds with oxirane groups, which provide a uniform film and do not suffer from odor problems (see specification page 3, lines 24-28). Applicants were able to achieve their objective by way of the claimed solventless reactive system, an essential feature of which is that only with the help of 2,3-dimethyl-3,4,5,6-tetrahydropyrimidine as catalyst can the reaction of epoxy resin/amine and blocked isocyanate/amine be adjusted so that the solventless reactive system is curable at room temperature and produces a uniform film at room temperature (page 12, lines 11-15 of the specification).

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. MPEP § 2142 quoting In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

The Examiner has taken a similar approach in both of the rejections described above. In general, the Examiner has identified reference that describe reactive systems that include blocked polyisocyanates, polyamines and epoxy resins and combined them with references that disclose various laundry lists of potential catalysts that may be used in curing the reactive systems.

With regard to the catalysts, Schmalstieg discloses the broad class of 2-methyltetra-hydropyrimidines substituted in the 1-position as described in

Groegler. Groegler discloses 1-substituted, 2-methyltetrahydropyrimidine where the 1-substituted group can be a straight-chain, branched-chain or cyclic, saturated, unsaturated or aromatic, optionally substituted hydrocarbon radical with from 1 to 17 carbon atoms. Tarbutton discloses catalysts that include at least one of imidazole, imidazoline, a substituted imidazole compound, a substituted imidazoline compound, 1,4,5,6-tetrahydropyrimidine and substituted 1,4,5,6-tetrahydropyrimidine compounds. JP 50-117771 discloses using cycloamides as catalysts. Thus, the Examiner has presented a very large list from which to choose a potential catalyst. However, "a 'laundry list' disclosure of every possible moiety does not constitute a written description of every species in a genus because it would not 'reasonably lead those skilled in the art to any particular species.'" MPEP § 2163 quoting Fujikawa v. Wattanasin, 93 F.3d 1559, 1571, 39 USPQ2d 1895, 1905 (Fed. Cir. 1996).

Further, although the cited art discloses structures that encompass the claimed catalyst, they do not disclose or in any way suggest that the claimed catalyst would be particularly effective at providing a solventless reactive system that does not exhibit odor problems, is curable at room temperature, and produces a uniform film at room temperature.

The Examiner cites a single example in Schmaltstieg to identify a system that includes a polyisocyanate blocked with an aromatic blocking agent, an epoxides resin, and a diamine, which hardened "overnight". The Examiner supplements this disclosure with the broad possibility that any of the catalysts disclosed in Groegler could have been used in the example, although no catalyst was used, because of the general suggestion at col. 5, lines 25-30 that catalysts according to Groegler could be used in the invention. However, there is no suggestion of the unique properties of the specific catalyst of the presently claimed invention and the unique properties it provides.

The Examiner also cites Lauman and Xiao for their generic description that suitable blocked isocyanates, diamines and epoxy resins can be reacted with catalysts "well known in the art" and then asserts that because JP 50-117771 and Tarbutton disclose various broad categories of catalysts, that the claimed invention is obvious. But where is the suggestion or motivation in any of the references to

suggest to one of ordinary skill in the art to pick the catalyst in the present invention?

Applicants assert that without improperly using the claimed invention as a template, there is no suggestion or motivation in either rejection to make the suggested modifications to arrive at the claimed invention.

Secondly, none of the cited references, either alone or in combination, directs one skilled in the art to use the specifically claimed components in combination with the single claimed catalyst. Based on the cited prior art combinations, there is no reasonable expectation of success for providing reactive systems that are curable at room temperature, based on blocked polyisocyanates, polyamines, compounds with oxirane groups, and the claimed catalyst, and which provide a uniform film and do not suffer from odor problems.

Finally, the disclosed references provide no guidance that would allow one skilled in the art to narrow the field of catalysts to the specifically claimed species.

Why would a skilled artisan have picked just the presently claimed catalyst to be used with the specific blocked polyisocyanates, amines and oxirane compounds? What guidance has the Examiner put forth from the cited references that one skilled in the art could have concluded that the presently claimed combination is especially good? The Examiner is silent with regard to these questions.

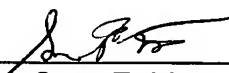
Neither the combination of Schmalstieg and Groegler, or the combination of Lauman, Xiao, Schmalstieg, JP 50-117771, Boutillier and/or Tarbutton provide any disclosure, suggestion or motivation to use the claimed 2,3-dimethyl-3,4,5,6-tetrahydropyrimidine as the catalyst in the claimed solventless reactive system with the expectation of obtaining reactive systems curable at room temperature, which provide a uniform film and do not suffer from odor problems. Therefore, Claims 13-32 are not obvious over the cited combinations of references.

### **CONCLUSION**

The teaching, motivation or suggestion to make the claimed solventless reactive system and the reasonable expectation of success are not found in the combined references. Therefore, the Examiner has not established a *prima facie* case of obviousness and the rejection of Claims 13-32 under 35 U.S.C. § 103(a) should be withdrawn.

In view of the above remarks, reconsideration of the rejections and allowance of claims 13-32 are respectfully requested.

Respectfully submitted,

By   
Gary F. Matz  
Agent for Applicants  
Reg. No. 45,504

Bayer Polymers LLC  
100 Bayer Road  
Pittsburgh, Pennsylvania 15205-9741  
(412) 777-3897  
FACSIMILE PHONE NUMBER:  
(412) 777-3902  
lo/MATZ/gfm145